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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,397	10/07/2003	Nobuyuki Hokari	A8319.0026/P026	5471

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EXAMINER	
NGUYEN, TAM M	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/679,397	HOKARI ET AL.	
	Examiner	Art Unit	
	Tam M. Nguyen	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *7-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 4, 2006 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6 and 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "in the absence of a reaction acceleration" was not described in the specification at the time the application was filed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCollum et al. (3,948,755) in view of Wilson et al. (3,733,259)

McCollum discloses a process for upgrading a heavy oil by contacting the heavy oil with water at a high temperature and pressure in the presence of a catalyst comprising a metal oxide to reduce metals (e.g., vanadium) and sulfur compounds in the heavy oil. McCollum also discloses that the water also contains a reaction accelerator (e.g., methyl alcohol). The process is operated at a temperature of from 600-900° F and at a pressure of about 4000 psi (27 MPa). It is noted that

McCollum does not specifically disclose that the vanadium is scavenged in the form of vanadium oxide and or metallic compound and does not disclose that sulfur is scavenged in the form of a sulfate and/or a metal sulfide. However, the heavy oil is contacted with water at a high temperature and pressure as claimed. It would be expected that at least one vanadium and at least one sulfur compound produced in the process of McCollum would be in the claimed form. (See col. 3, line 56 through col. 4, line 18; col. 7, line 67 through col. 8, line 50; col. 9, line 65 through col. 10, lines 6; table 9)

McCollum does not disclose that water is heated to 300 to 500 and pressuring to 10 MPa to 30 MPa before contacting with the heavy oil, does not disclose that the feedstock is a hydrocarbon heavy oil, does not disclose that water is either supercritical water or subcritical water, and does not disclose that the process is operated in the absence of a reaction accelerator.

Wilson discloses a process for removing sulfur and metals (e.g., vanadium) from a heavy oil feed by contacting the feed with water. See abstract.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of McCollum by utilizing a heavy oil as a feedstock as taught by Wilson because it would be expected that either liquid feed or solid feed can be treated in the process of McCollum.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of McCollum by heating and pressuring the water as claimed because McCollum teaches that the process is operated at a temperature of from 600-900° F and at a pressure about 4000 psi (27 MPa). Therefore, it is affective to heat and pressure the water to the operating condition before passing the water into the reaction zone.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of McCollum by operating the process of McCollum at either supercritical water or subcritical water because McCollum suggests water used in the process is at high pressures and at a temperature of from 600 to 900° F. Therefore, one of skill in the art would operate the process of McCollum at any condition including at either supercritical water or subcritical water.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of McCollum by operating the process in the absence of a reaction accelerator if one of skill in the art does not desire the function of the reaction accelerator.

Claims 1 and 3-6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (3,733,259)

Wilson discloses a process for removing sulfur and metals (e.g., vanadium) from a heavy oil feed. The feed is contacted with water at a high temperature and pressure and the mixture of the heavy oil and water is then contacted with a scavenger (e.g., catalyst comprising alumina) to produce a product having a low amount of sulfur and vanadium. (See col. 1, lines 11-26; col. 2, lines 22-62; col. 3, line 1; Example II and III, tables I, II and III)

Wilson does not specifically disclose that the vanadium is scavenged in the form of vanadium oxide and or metallic compound and does not disclose that sulfur is scavenged in the form of a sulfate and/or a metal sulfide. However, the heavy oil is contacted with water at a high temperature and pressure as claimed. It would be expected that the at least one vanadium and at least one sulfur compound produced in the process of Wilson would be in the claimed form.

Wilson does not specifically disclose that water is in either supercritical or subcritical. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Wilson by operating the process of Wilson at either supercritical water or subcritical water because Wilson teaches that the process is operated at temperature of from 750 to 850° F and at a pressure of from atmospheric up to 100 atm. Therefore, one of skill in the art would operate the process of Wilson at any condition including at either supercritical water or subcritical water.

Wilson does not disclose that water is heated to 300 to 500 and pressuring to 10 MPa to 30 MPa before contacting with the heavy oil. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Wilson by heating and pressuring the water as claimed because Wilson teaches that the process is operated at a temperature of from 399-454° C and at a pressure about 2-20 MPa. Therefore, it is affective to heat and pressure the water to the operating condition before passing the water into reaction zone.

Response to Remarks

The argument that McCollum does not disclose or suggest reacting the heavy oil in the absence of a reaction accelerator is not persuasive because of the new rejection above.

The argument that in the present invention, the reaction in which the vanadium is oxidized is an oxidation reaction whereas the reaction of McCollum and Wilson are a reduction reaction using hydrogen as a reducing agent is not persuasive. In the processes of McCollum and Wilson, the mixture of feedstock and water is contact with catalyst/scavenger to reduce sulfur

and vanadium as claimed. There is no distinction between the claimed process and the process of McCollum.

The argument that Wilson does not disclose or suggest reacting the heavy oil in the absence of a reaction accelerator is not persuasive because Wilson does not disclose the use of a reaction accelerator.

The argument that the present invention used alumina as a scavenger while Wilson discloses alumina only as a catalyst support and not as a catalyst per se is not persuasive because both the claimed scavenger and the catalyst of Wilson comprise alumina.

The argument that the scavenger of the invention is different from a reaction accelerator or catalyst is not persuasive. Both the reaction accelerator and the catalyst of Wilson are function to remove sulfur and vanadium. There is no distinction between the claimed scavenger and the catalyst of Wilson.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (571) 272-1452. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tam M. Nguyen
Examiner
Art Unit 1764

TN

4/10/06